

## CLAIMS LISTING

Application No.: 10/714,956  
Applicant: GARDNER, Wilson  
Filing Date: 11/18/2003  
Examiner: Jesús D. Sotelo  
Art Unit: 3617

### Claim 1 (amended)

A biomechanically correct pedal powered paddling system for small watercrafts comprising:

- a. a watercraft attaching frame having:
  - i. a central width-adjustable joining portion,
  - ii. two opposing watercraft-clamping members for attaching said frame to watercraft gunwale,
  - iii. two opposing pedal-assembly receiving portions,
  - iv. two opposing primary linkage pivoting members,
  - v. frame extension extending perpendicularly from each end portion of said frame, and
  - vi. two opposing secondary linkage pivoting members,
- b. a pedal drive assembly having:
  - i. a primary pedal drive shaft having extension receiving female members at each end,
  - ii. two drive shaft extensions having non-rotatable male ends longitudinally adjustably mating with female drive shaft members and paddle drive members distal from the primary drive shaft, and
  - iii. two foot pedals rotably attached to offset member integral with pedal-a pedal drive shaft forming ~~crank~~ the crank member,
- c. an upper and lower paddle-attaching portion each having:
  - i. a paddle receiving portion,

- ii. a linkage attaching portion having single axis rotational freedom from paddle receiving portion, and
- iii. releasable paddle locking member,
- d. a linkage array having:
  - i. a paddle crank arm having a non-rotational female end adapted to receive the male end of the drive shaft extensions, and a rotational end adapted to secure to the linkage attaching portion of the above paddle receiving portion,
  - ii. a swing lever,
  - iii. a diagonal support member,
  - iv. a vertical member, and
  - v. a plurality of pivotal axle members
- e. means of simulating the biomechanical motion of conventional arm powered paddling.

Claim 2\_(amended)

The biomechanically correct pedal powered paddling system of claim 1 wherein the pedal drive portion-assembly comprises a drive extension at each end thereof having a longitudinally slidable non-rotational joint therebetween.

Claim 3 (as filed)

The biomechanically correct pedal powered paddling system of claim 1 wherein the paddle crank arm is rotably driven by force generated by rotational motion of the pedal drive assembly.

Claim 4 (as filed)

The biomechanically correct pedal powered paddling system of claim 1 wherein upper and lower paddle clamps are adapted with a quick-release apparatus for easy removal of said paddles.

Claim 5 (deleted)

~~The biomechanically correct pedal powered paddling system of claim 1 through 4 wherein use thereof is for propelling a small watercraft using ones leg power or other forms of manual or mechanical force, while synthesizing the biomechanical motion of conventional arm powered paddling.~~

Claim 6 (added)

The biomechanically correct pedal powered paddling system of claim 1 wherein the simulation of the natural paddling motion is achieved by a compound motion generated by a dual axis-dual pivot further comprising a lower paddle-connecting point pivotally attached to an extremity of a rotating crank arm, and an upper paddle-connecting point pivotally attached to the extremity of a swing lever.

Claim 7 (added)

The biomechanically correct pedal powered paddling system of claim 6 wherein the lower-mid section of a paddle follows a circular orbit about a center point of the drive crank arm, and the upper section of the paddle follows a semi-circular arc about a center point of the swing lever where said arc center point is locate generally above the drive crank arm center.

Claim 8 (added)

The biomechanically correct pedal powered paddling system of either claim 1, 2, 3, 4, 5, 6, or 7 wherein use thereof is for propelling a small watercraft using ones leg power while synthesizing the biomechanical motion of conventional arm powered paddling.

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  - v. frame extension extending perpendicularly from each end portion of said frame, and
  - vi. two opposing secondary linkage pivoting members,
- b. a pedal drive assembly having:
  - i. a primary pedal drive shaft having extension receiving female members at each end,
  - ii. two drive shaft extensions having non-rotatable male ends longitudinally adjustably mating with female drive shaft members and paddle drive members distal from the primary drive shaft, and
  - iii. two foot pedals rotably attached to offset member integral with a pedal drive shaft forming the crank member,
- c. an upper and lower paddle-attaching portion each having:
  - i. a paddle receiving portion,

- ii. a linkage attaching portion having single axis rotational freedom from paddle receiving portion, and
  - iii. releasable paddle locking member,
- d. a linkage array having:
  - i. a paddle crank arm having a non-rotational female end adapted to receive the male end of the drive shaft extensions, and a rotational end adapted to secure to the linkage attaching portion of the above paddle receiving portion,
  - ii. a swing lever,
  - iii. a diagonal support member,
  - iv. a vertical member, and
  - v. a plurality of pivotal axle members
- e. means of simulating the biomechanical motion of conventional arm powered paddling.

**Claim 2 (amended)**

The biomechanically correct pedal powered paddling system of claim 1 wherein the pedal drive assembly comprises a drive extension at each end thereof having a longitudinally slidable non-rotational joint therebetween.

**Claim 3 (as filed)**

The biomechanically correct pedal powered paddling system of claim 1 wherein the paddle crank arm is rotably driven by force generated by rotational motion of the pedal drive assembly.

**Claim 4 (as filed)**

The biomechanically correct pedal powered paddling system of claim 1 wherein upper and lower paddle clamps are adapted with a quick-release apparatus for easy removal of said paddles.

**Claim 5 (deleted)**

**Claim 6 (added)**

The biomechanically correct pedal powered paddling system of claim 1 wherein the simulation of the natural paddling motion is achieved by a compound motion generated by a dual axis-dual pivot further comprising a lower paddle-connecting point pivotally attached to an extremity of a rotating crank arm, and an upper paddle-connecting point pivotally attached to the extremity of a swing lever.

**Claim 7 (added)**

The biomechanically correct pedal powered paddling system of claim 6 wherein the lower-mid section of a paddle follows a circular orbit about a center point of the drive crank arm, and the upper section of the paddle follows a semi-circular arc about a center point of the swing lever where said arc center point is locate generally above the drive crank arm center.

**Claim 8 (added)**

The biomechanically correct pedal powered paddling system of either claim 1, 2, 3, 4, 5, 6, or 7 wherein use thereof is for propelling a small watercraft using ones leg power while synthesizing the biomechanical motion of conventional arm powered paddling.